

surrounding the central area and a peripheral area surrounding the intermediate area;

a semiconductor chip disposed on the main surface;

a first bump unit disposed in the central area of the back surface to radiate heat from the semiconductor device, the first bump unit including a plurality of bumps disposed a first distance apart from each other; and

a second bump unit formed in the peripheral area of the back surface for transmitting signals, the second bump unit including a plurality of bumps disposed a second distance apart from each other sufficient to assure that upon application of a heat treatment to the device causing the bumps of the first and second bump units to melt, the bumps of the second bump unit remain apart from each other, the second distance being greater than the first distance and less than a third distance between the central area and the peripheral area,

wherein the bumps of the first bump unit are sufficiently close to each other that upon the application of the heat treatment to the device, the bumps of the first bump unit fuse into a unitary body.